

**UNITED STATES AIR FORCE  
ARMSTRONG LABORATORY**

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**Preventing Work-Related  
Musculoskeletal Illnesses Through  
Ergonomics: The Air Force PREMIER  
Program Volume 1: Management  
Guidelines**

Edward J. Klinenberg, Major, USAF  
Cynthia D. Cogburn, Major, USAF  
Don E. Goddard, Major, USAF

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Occupational and Environmental Health  
Directorate  
Occupational Medicine Division  
2402 E. Drive  
Brooks AFB, TX 78235-5114

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EDWARD J. KLINENBERG, Maj, USAF, BSC  
Chief, Ergonomics Function



TIMOTHY C. IHRY, Lt Col, USAF, BSC  
Chief, Occupational Medicine Division

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13. ABSTRACT (Maximum 200 words)  This report introduces the AF PREMIER Program. The primary goal of the PREMIER program is to minimize the negative impact on AF mission accomplishment by preventing work-related musculoskeletal disorders (WMD) among AF employees. The AF PREMIER program consists of a series of modules designed to anticipate, recognize, evaluate, and control ergonomic risk factors associated with WMD development. This report describes the overall philosophy of the AF PREMIER program and provides detailed management guidelines for implementation of the program.				
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PREVENTING WORK-RELATED MUSCULOSKELETAL ILLNESSES THROUGH ERGONOMICS:  
THE AIR FORCE PREMIER PROGRAM  
VOLUME 1: MANAGEMENT GUIDELINES

INTRODUCTION

Welcome to the AF PREMIER Program. PREMIER stands for PREventing Musculoskeletal Illnesses through ERgonomics. The primary goal of the PREMIER program is to minimize the negative impact on AF mission accomplishment by preventing work-related musculoskeletal disorders (WMD) among AF employees. WMD are impairments of muscles, tendons, joints, and nerves which occur over time and are not the result of an acute or instantaneous event (e.g. slips or falls). They are sometimes referred to as cumulative trauma disorders (or CTD) or repetitive motion injuries (RMI).

The term CTD or RMI is somewhat misleading as experts are still divided regarding the extent repetitive motion plays in actual damage to body parts. Instead, there appears to be a variety of biomechanical, psychosocial, and physiological factors associated with workers developing musculoskeletal disorders. Biomechanical factors include job attributes such as fixed and awkward postures, excessive force, vibration, direct pressure, cold temperatures and repetition. Physiological factors include work duration and shifts, work environment and physical condition. Less tangible factors or psychosocial factors include job satisfaction, interpersonal relations and personality traits.

Whatever the etiology, WMD in the workplace are common, comprising over 60 percent of the illnesses reported to the Bureau of Labor Statistics (BLS) and the Air Force Occupational Illness Data Registry. The direct cost to U.S. private industry is estimated at two billion dollars per year. Though costs to the Air Force are difficult to obtain, direct and indirect WMD costs for active duty AF (ADAF) and civilian personnel in FY 95 were estimated to be as high as 150 million dollars with over 42,000 ADAF personnel likely affected. From Jul 93 to Dec 95, over 3000 WMD workers compensation cases were processed with a total direct cost of 43.8 million dollars.

The AF PREMIER Program consists of a series of modules designed to anticipate, recognize, evaluate, and control ergonomic risk factors associated with WMD development. It is based, in part, on four major program elements the Occupational Safety and Health Administration believes is important for a successful ergonomics program: worksite analysis, hazard prevention and control, medical management, and training and education. Emphasis is placed on reducing the risks in hazardous tasks routinely performed by AF employees. To accomplish this in a cost-effective manner, a series of screening, assessment, and management tools have been developed to narrow the focus of each installation's efforts (see Figure 1 on next page).

The **initial screening** consists of identifying **potential problem jobs** on the installation based on collected information (recorded WMD cases, trend analysis, proactive job surveys), professional judgment, and overall corporate knowledge. While not expected to be 100% perfect initially, it gives each installation a good starting point.

The **Job Requirements/Physical Demands Survey (JR/PD)** further screens potential problem jobs. When used properly, the JR/PD helps determine and document if associations between ergonomic risk factors, employee discomfort, and reported WMD exist in a potential problem job. In other words, the JR/PD helps the installation decide which potential problem jobs are actually **problem jobs**. Administered by Public Health, the JR/PD is particularly useful where the existing data sources do not adequately capture the true prevalence of WMD on the installation. The JR/PD also provides a mechanism for identifying key routine tasks performed by employees which is important for subsequent

problem solving efforts and can serve as a benchmark to evaluate intervention efforts. The JR/PD *is not* meant to serve as an initial screening mechanism for the base.

The Level I and Level II analyses are designed for use in **validated problem jobs**. The Level I analysis allows Bioenvironmental Engineering Technicians (BET), through structured guides, to identify specific hazardous tasks within each problem job. This is essentially a pattern matching exercise based on task observations and employee interviews rather than discrete measurements. Once identified, the BET uses an extensive series of case studies to recommend proven control strategies for specific tasks. The idea here is that by reducing ergonomic risk, you will eventually reduce WMD incidence and severity rates. The Level I analysis can also be used for suspected WMD investigations. Finally, the Level I guides include a series of design guidelines which allow the BET to evaluate new tools and workstations for potential ergonomic problems.

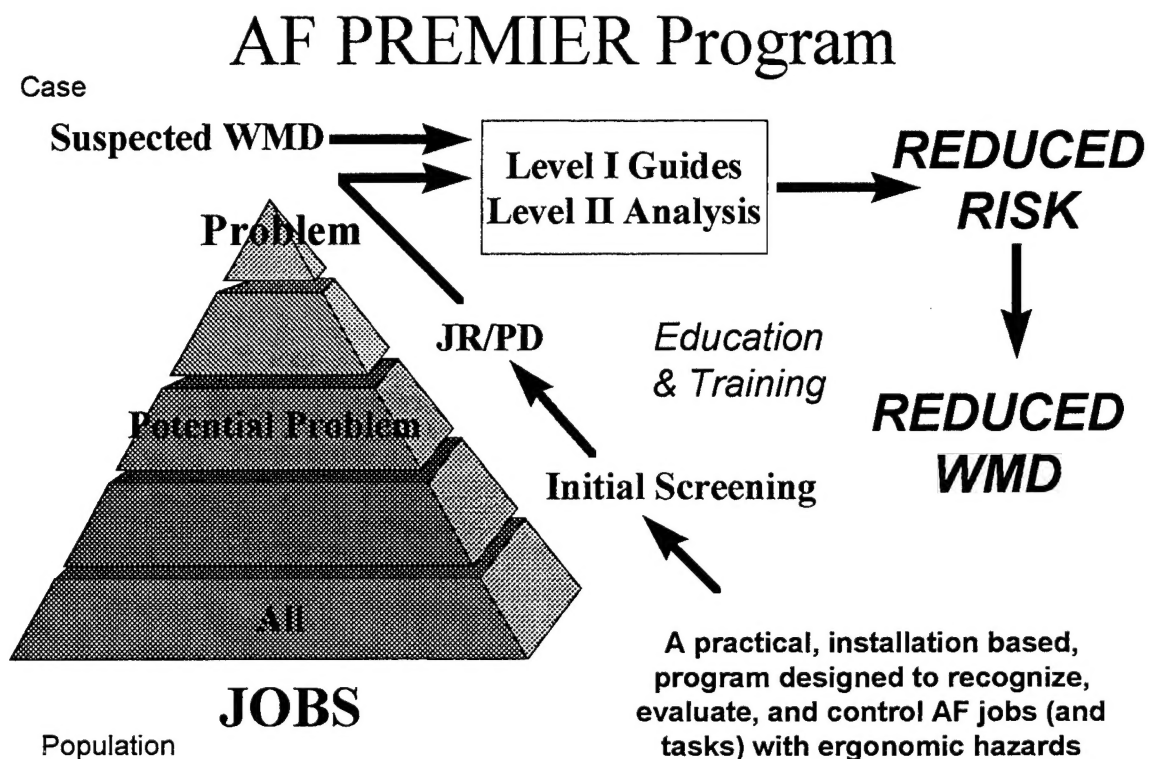


Figure 1. Overview of AF PREMIER Program

Caution must be exercised when using a Level I analysis. Control strategies may apply to tasks performed under specific conditions. For example, a pistol grip drill can keep the hand and wrist in a neutral posture while drilling on a vertical surface at elbow level, but it can cause the hand and wrist to deviate (bend) while drilling on surfaces at other levels and orientations. Where Level I solutions are not available, do not apply, or a complex situation exists, a Level II analysis should be used. A Level II analysis actually quantifies exposure to the extent practical and results in recommended control measures to minimize or eliminate the exposure. A higher level of expertise and training is required to conduct a Level II analysis.

Once the job has been analyzed, recommendations have been made, and controls implemented, it is critical to follow-up. A combination of follow-up Level I analysis, JR/PD, and passive surveillance is



suggested for documenting the effectiveness of the recommended controls. Ergonomics is still a young science. It might take a few times before the right combinations of controls can be found to reduce WMD in a particular job.

Management and worker involvement is critical to program success. Employees doing the work are a vital link to effective problem-solving. Their input should be actively solicited and used as much as possible in selecting control measures to reduce risks. Employee ideas are the best resource available. They provide information on what proposals can be used and which proposals will not work.

This, in summary, is a short overview of the AF PREMIER Program. The AF PREMIER management guidelines provide a more detailed description of the elements in the AF PREMIER Program. The guidelines are formatted as a generic AFOSH Standard to allow for easy conversion into an installation regulation, if needed. Subsequent volumes of this series will include very detailed descriptions and directions for use of the JR/PD and Level I Guides along with documented ergonomic success stories from various installations. After reviewing this report, please take the time to complete and return the included satisfaction survey.



## APPENDIX A



## ***AF PREMIER PROGRAM MANAGEMENT GUIDELINES***

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These guidelines prescribe the minimum requirements to anticipate, recognize, evaluate, and control work-related musculoskeletal disorders associated with routine exposures in Air Force workplaces. It does not apply to incidental or instantaneous events leading to contusions, lacerations, fractures or amputations.

These guidelines apply to operations performed by Department of the Air Force military and civilian employees, Air National Guard, Air Force Reserve, and direct hire foreign nationals (as established by Status of Forces Agreements) or the Air Force, Air National Guard, and Air Force Reserve. These requirements and procedures do not apply to contractor operations or government-owned, contractor-operated (GOCO) operations.

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## *Chapter 1*

### **HAZARDS AND HUMAN FACTORS**

#### **1.1 Hazards.**

1.1.1. Air Force employees exposed to ergonomic stressors risk acute injuries, subchronic illnesses, and chronic illnesses. Exposure to these stressors can lead to debilitating work-related musculoskeletal disorders (WMD), including peripheral neurological disorders; therefore, these stressors should be reduced whenever feasible.

1.1.2. Risk factors can be used to redesign jobs and reduce the risk of WMD. These risk factors include repetitive motion; sustained activity; fixed or awkward posture; forceful exertion; prolonged contact with tools and equipment; vibration; and cold temperature on hands, fingers, arms, etc.

1.1.3. Risk factors alone cannot be used to indicate that a hazard exists. Current knowledge is limited on how these factors relate with each other and how they relate to WMD. To identify WMD hazards, we must combine risk factor identification with other information such as data on illness trends and discomfort.

1.1.4. Once a WMD progresses from mild symptoms to pain and disability, it is very difficult to treat with success. Early recognition and prompt treatment of employee symptoms are critical to prevent invasive and complicated medical procedures.

#### **1.2 Human Factors.**

1.2.1. Risk factors other than physical stressors can contribute to WMD. These factors, such as psychosocial and individual characteristics, are only peripherally addressed in this standard.

1.2.2. Because surveying workers can contribute to the apparent incidence of WMD, the program managers must have a clear reason to conduct these surveys. An analysis of risk factors and of illness and injury trends should show that a group of workers has a sufficient risk of WMD before workers are questioned about discomfort and risk factors.

1.2.3. Worker and management involvement is critical to the success of any effort to prevent WMD. The elimination or reduction of risk factors directly affects the methods that workers use to do their jobs. If health and safety professionals push for solutions that workers and management do not accept, the changes will have little effect.

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## *Chapter 2*

### **RESPONSIBILITIES**

**2.1. SAF/MIQ.** The Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health) provides cross-functional policy and guidance for ergonomic hazards.

**2.2. HQ AFMOA/SGOE.** The Chief of Environmental and Occupational Health Division, Air Force Medical Operations Agency shall:

- Provide policy and guidance to ensure the effective implementation of the Air Force WMD prevention program.
- Advocate for resources to support the program elements and initiatives needed to identify, evaluate, and resolve WMD trends.

**2.3. Air Force Safety Center (AFSC).** AFSC shall establish implementation policy for safety interfaces with programs associated with recognizing, evaluating, and controlling WMD.

**2.4. Air Force Inspection Agency (AFIA).** AFIA shall implement inspection programs to evaluate compliance with the requirements in this standard.

**2.5. Major Command Surgeon General (MAJCOM/SG).** Each MAJCOM, Direct Reporting Unit, and Field Operating Agency Surgeon shall:

- Integrate measures that minimize exposure to ergonomic risk into workplace operations under their control.
- Contact the Armstrong Laboratory Occupational and Environmental Health Directorate, Occupational Medicine Division (AL/OEM), Brooks AFB, TX 78235-5114, for technical guidance and assistance needed to resolve WMD issues and risks.
- Review the effectiveness of installation WMD prevention programs as part of the medical staff visits.
- Provide sufficient budget and manpower resources to meet the requirements of this standard.

**2.6. Armstrong Laboratory (AL).** Armstrong Laboratory shall:

- Provide technical information and consultative services on anticipating, recognizing, evaluating, and controlling ergonomic risks.
- Serve as an expert technical advisor and reviewer for ergonomics training developed and offered by USAF School of Aerospace Medicine (USAFSAM), as requested by USAFSAM.
- Recommend technical changes and supplements to this standard as needed.
- Upon request, assist in developing statements of work for ergonomics contractor services.
- Maintain a database of potential Air Force ergonomic problems and the effectiveness of controls implemented.
- Develop solutions for reducing or eliminating ergonomic risks in common occupational groups and distribute them to the BE at each installation.

**2.7. US Air Force School of Aerospace Medicine (USAFSAM).** USAFSAM shall provide ergonomics training through Air Force specialty code awarding and advanced courses to assist those who implement programs to reduce WMD.

#### **2.8. Installation Level Responsibilities.**

**2.8.1. Commanders.** Commanders, Directors, and Functional Managers shall:

- Ensure workplaces and processes do not expose employees to known WMD risks.
- Ensure workstations, devices, tools, and equipment are properly designed and do not contribute to WMD.



- Provide adequate resources to meet the responsibilities in this standard.
  - Ensure supervisors and workers receive appropriate training on prevention of WMD.
- 2.8.2. Occupational Health Working Group (OHWG).** The Occupational Health Working Group, or Ergonomics Working Group (EWG) if one is established, shall:
- Provide assistance to the installation commanders' WMD prevention efforts.
  - Establish and continually refine signal risk factors that will be used to help identify problem jobs.
  - Identify potential hazards that should be analyzed further.
  - Review the results of reported WMD for trends.
  - Advise the installation AFOSH Council and Aerospace Medicine Council (AMC) on the effectiveness of the installation WMD prevention program.
- 2.8.3. Supervisors.** Supervisors shall:
- Participate in the OHWG or EWG to discuss specific ergonomic problems that relate to their units or workers.
  - Encourage workers to promptly report signs and symptoms of WMD suspected to be associated with the job.
  - Assist in identifying ergonomic hazards and stressors in the work area.
  - Take action to eliminate or minimize ergonomic risk factors that are associated with injury or illness.
  - Consult with workers and review improvements that will abate the ergonomic risk factors.
  - Enforce the use of required measures to control ergonomic risk factors, including engineering controls, administrative controls, work practice controls, and personal protective equipment (PPE).
  - Attend WMD awareness education when provided.
  - Provide or arrange job-specific WMD prevention training to employees as specified in this standard.
  - Inform BE of plans for new or modified operations, jobs, or procedures.
  - Ensure employees with signs or symptoms of WMD are promptly evaluated by a health care provider.
  - Ensure employees participate in efforts to remove ergonomic risk factors from their processes.
- 2.8.4. Medical Treatment Facility (MTF) Commander.** In addition to the commander responsibilities in 2.8.1., the MTF Commander shall:
- Provide appropriate manpower and resources for medical personnel involved in efforts to reduce WMD
  - Ensure health care providers properly identify, document, and report occupationally-related WMD.
- 2.8.5. Occupational Medicine or Flight Medicine.** Chief, Occupational Medicine or Chief, Flight Medicine shall:
- Assist commanders in determining whether to establish an EWG or depend on the OHWG for installation guidance.
  - Develop or adopt critical pathways or practice parameters for evaluation, medical management, and follow-up of WMD treated on the installation.
  - Prescribe medically appropriate restrictions from normal duty to mitigate the effects of ergonomic stressors.
  - Brief health care providers on the clinical management and reporting of WMD and suspected WMD.
- 2.8.6. Medical Services.** Chief, Medical Services shall ensure that health care providers properly identify cases that they suspect to be WMD to Public Health (PH) using an SF 513, or electronic equivalent.
- 2.8.7. Bioenvironmental Engineering (BE).** Chief, BE shall:
- Assist commanders in determining whether to establish an EWG or depend on the OHWG for installation guidance.
  - Document work analyses in the industrial case file or facility case file.
  - Prioritize and perform work analyses.
  - Assist supervisors in selecting the appropriate control measures to eliminate or minimize ergonomic risk factors.
  - Evaluate the effectiveness of the implemented controls in eliminating or minimizing risk factors.
  - Investigate reported or suspected WMD.
  - Review plans for new or modified operations to ensure ergonomic design principles have been considered.

- At the request of a health care provider, assist the supervisor in modifying the workplace to accommodate the medical restrictions for an existing WMD.
- Assist the ground safety manager with investigating incidents when routine risk factors may have contributed to the injury.
- Assign risk assessment codes (RACs) to known WMD hazards.
- Submit to AL/OEM copies of reports that describe solutions that have not been described in any guidance and that have been effective in resolving hazards.

**2.8.8. Ground Safety Manager.** The Ground Safety Manager shall:

- Participate in the OHWG, or EWG if one has been established.
- Maintain and analyze basic information about injuries and trends in coordination with PH.
- Compile basic information about the musculoskeletal injuries, such as the type of work being performed, when and where the incident occurred, the body parts involved, and the classification of the injury.
- Assist BE in work analyses, as requested.
- Investigate musculoskeletal injuries associated with single incidents.

**2.8.9. Public Health (PH).** Chief, PH shall:

- Participate in the OHWG, or EWG if one is established.
- Coordinate with installation Chief of Civilian Personnel and the ground safety manager to establish an on-going installation surveillance process for WMD.
- Compile injury and illness data to determine WMD incidence, severity, and restricted workday rates in problem jobs and provide this information to the OHWG or EWG.
- Review the results of reported WMD and risk factor data for trends.
- Administer job requirements and physical demands surveys (JR/PD) to employees in potential problem jobs.
- Analyze data for association among ergonomic risk factors, employee discomfort, and reported WMD (if available) and reports results to OHWG or EWG.
- Provide WMD awareness education and training to supervisors, workers, health care providers, and other installation personnel.
- Evaluate the effectiveness of the controls in reducing employee discomfort and WMD incidence.
- Document JR/PD results in the appropriate workplace case file.

**2.8.10. Physical Therapy (PT) and Occupational Therapy (OT).** PT and OT or, on installations without an authorized PT or OT, the senior craftsman in consultation with the MTF's referral facility shall:

- Participate in the OHWG, or EWG if one is established.
- Provide information on back injuries, restricted duty, work hardening, stretching exercises, and worker rehabilitation as requested by BE, PH, or OM.
- Assist BE with work analyses, as requested.
- Coach employees to ensure the medical restrictions are incorporated into work practices, as requested.
- Assist PH with WMD awareness education and training, as requested.
- Provide caseload information to PH to ensure cases are entered in data collection system.

**2.8.11. Civilian Personnel (CP).** CP shall provide PH with civilian WMD data including compensation costs, lost workdays, and restricted workdays.

**2.8.12. Workers.** Each Air Force employee covered by this standard shall:

- Participate in activities designed to anticipate, recognize, evaluate, and control ergonomic risks.
- Provide suggestions for improving the work environment regarding potential or actual ergonomic risk factors.
- Promptly report to supervisor musculoskeletal complaints or symptoms suspected to be associated with the job.
- Attend WMD awareness education and specific job training as directed.
- Comply with the required control measures that reduce ergonomic risk factors.

## *Chapter 3*

### **GENERAL PROGRAM REQUIREMENTS**

#### **3.1. Goals.**

3.1.1. The primary goal of the program is to minimize the negative impact on AF mission accomplishment by preventing WMD among AF employees. Success in achieving this goal is the commander's responsibility. The program described in this chapter outlines how the SG and SE communities support the commanders' efforts to reduce WMD.

3.1.2. The secondary goal is to reduce the severity of WMD through early medical management.

3.1.3. Additional goals of the program are to:

- Promote continual improvement of the control of workplace risk factors.
- Ensure management leadership and employee involvement in controlling exposures to risk factors.
- Ensure the employees are informed about WMD and the factors that can cause or aggravate them.
- Enhance productivity by improving the ergonomic design of the workplace.

**3.2. Program Elements.** The basic elements of an installation WMD prevention program shall include:

- Identifying potential problem jobs;
- Validating problem jobs;
- Analyzing problem jobs;
- Implementing control measures to reduce employee risk factors;
- Anticipating ergonomic design needs for new or changed jobs;
- Providing medical management;
- Training and educating employees and supervisors;
- Recordkeeping; and
- Ensuring employee involvement in the job improvement process.

**3.3. Identifying Potential Problem Jobs.** The OHWG or EWG lists jobs with the potential risk for developing WMD. This step provides an initial screen to narrow the focus of the installation program. It should not be resource or time intensive. The decision is based on collected information (case initiated, trend analysis, proactive job surveys (not required for administrative jobs)), professional judgment, and overall corporate knowledge. The list of potential problem jobs is refined whenever new information becomes available.

**3.3.1. Case Initiated.** The health care provider is the key information link for ensuring suspected WMD cases are brought to the attention of PH and BE. When a suspected WMD is discovered during treatment, the health care provider completes and forwards an SF 513, or the electronic equivalent, to PH. The health care provider can refer the patient to the local occupational medicine service if such service is available.

3.3.1.1 PH interviews the patient, completes an AF Form 190, and forwards this form to BE.

3.3.1.2 BE investigates specific cases of alleged illnesses and repetitive injuries. BE assesses whether the risk factors associated with the task could be causative factors in the illness or repetitive injury reported.

3.3.1.3. The findings are recorded on an AF Form 190 or equivalent. The AF Forms 190 are reviewed by the OHWG and then forwarded to the MTF for inclusion in the medical records.

3.3.1.4. Recommended changes or solutions shall not be documented on AF Forms 190 or other reports that are included in the medical records. The report that is documented in the medical records should address only risk factors and their potential to contribute to the injury or illness.

3.3.1.5. When appropriate, BE sends a separate report of any recommended solutions to the commander, facility manager, or supervisor. Any recommendations should include a broad range of input from the employees and the work supervisors to make sure the specific needs of the users have been considered.

3.3.1.6. If the BE evaluation determines that there are other workers with similar risk factors, then the job should be classified as a potential problem job.

3.3.1.7. BE should use a similar evaluation process for civilian employee WMD compensation claims.

3.3.2. **Trend Analysis.** PH reviews a variety of data sources to identify jobs with adverse WMD trends. Jobs with adverse WMD trends should be classified as potential problem jobs. Initially, PH should obtain as much historical data as practical to determine the extent of WMD on an installation.

3.3.2.1. Examples of data sources include:

- Medical care logs from acute care clinic, emergency room, primary care clinic, etc.
- Workers' Compensation claim data (primarily U.S. Department of Labor Forms CA-1, *Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation*, and CA-2, *Notice of Occupational Disease and Claim for Compensation*);
- Occupational Safety and Health (OSHA) 200 Logs;
- Aerospace Safety Automation Program (ASAP) and local mishap forms; and
- AF Form 190, *Occupational Illness Investigation*.
- Ambulatory Data System

3.3.2.2. A list of WMD by the International Classification of Diseases, Clinical Modification, 9th Revision (ICD-9CM) codes can be found in attachment 3.

3.3.2.3. PH will take measures to ensure patient confidentiality is maintained during data review and analysis.

3.3.3. **Proactive Job Surveys.** Industrial work area supervisors, as a part of the required Job Safety Analysis (JSA), periodically screen jobs and compare their observations with signal risk factors (see paragraph 4.3).

3.3.3.1. BE reviews the JSA evaluations during periodic industrial hygiene visits. Each job exceeding one or more of the signal risk factors should be classified as a potential problem job.

3.3.3.2. The OHWG or EWG may also use the signal risk factors independently as an initial screening tool for identifying installation-wide potential problem jobs.

3.3.4. The OHWG or EWG notifies those organizations that have potential problem jobs.

#### **3.4. Validating Problem Jobs.**

3.4.1. Potential problem jobs may be validated by the administration of a JR/PD.

3.4.2. The voluntary and anonymous JR/PD is administered by PH. To the extent practical, workers should be grouped so those who perform similar activities and use similar equipment are surveyed as a homogeneous exposure group. Initial emphasis should be placed on jobs, organizations, and homogeneous exposure groups with a history of WMD. A sufficient number of workers (>80%) need to be surveyed to insure a representative sample.

3.4.3. PH educates the employees sufficiently so the surveys will be done correctly.

3.4.4. PH analyzes the survey data to establish discomfort prevalence ratios, to help identify associations between ergonomic risk factors and employee discomfort, to verify the completeness of the illness and injury data, and to help BE identify specific activities that may need further analysis.

3.4.5. PH presents its findings at the next OHWG or EWG meeting and files the results in the appropriate case file or building folder file.

3.4.6. The OHWG or EWG reviews the survey findings and determines if the potential problem job is a problem job. This decision takes into account whether an association can be shown between risk factors, employee discomfort, and WMD trends.

3.4.7. BE will enter the findings of the OHWG or EWG in the appropriate case file or facility folder and will compile an inventory of all problem jobs.

3.4.8. The OHWG or EWG notifies those organizations that have problem jobs.

#### **3.5. Analyzing Problem Jobs.**

3.5.1. BE conducts a work analysis of the risk factors for each problem job. This analysis may be included as part of the periodic industrial hygiene survey. An analysis for a job that has been shown to cause injury or illness will be done within 60 days of that determination.

3.5.2. The work analysis will target the risk factors that are associated with the areas of the body that have been identified as having discomfort, pain, illness, or injury.

3.5.3. Where practical, the work analysis should include videotape documentation of the specific processes and activities being evaluated. These videotapes can be used to compare and contrast changes in tasks and risk factors.

3.5.4. Each work analysis attempts to either match risk factors with known solutions or quantify risk factors so solutions can be devised to reduce the risk. In cases where there is a complex interaction of ergonomic risk factors and where serious problems exist, the work analysis should quantify the risk factors to the extent practical.

3.5.5. BE sends a report of the work analysis to the supervisor of the work group and to other officials according to the local policy. BE keeps a copy in the appropriate case file or facility folder. This report may be included as part of a periodic industrial hygiene survey.

### **3.6. Control Measures.**

3.7.1. The work group supervisor and the affected workers attempt to select control measures that will abate the risk factors. Upon request, BE assists the supervisor and employees with advice on which control measures are likely to eliminate or reduce the risk factors that are associated with injury or illness. Control measures include engineering controls, work practice controls, administrative controls, and personal protective equipment.

#### **3.6.2. Engineering Controls.**

3.6.2.1. Engineering controls are the preferred and first-line method of control when they are feasible. These measures include manipulating or changing the design of the job, the workstation, the tools, or the equipment used by the worker.

3.6.2.2. If permanent engineering controls cannot be immediately implemented, temporary measures to modify or minimize the identified risk factors should be employed.

3.6.2.3. Some engineering control changes may require approval by the AFMC depot manager who develops the technical orders (TO) that govern work operations.

#### **3.6.3. Work Practice Controls.**

3.6.3.1. Work practice controls generally involve changing or improving procedures routinely followed by the worker. These practices include timely equipment maintenance, routine tool-sharpening, appropriate tool selection, proper orientation of the work, and arrangement of the working surface.

3.6.3.2. Some changes in work practice controls may require approval by the AFMC depot manager who develops the TO that governs work operations.

#### **3.6.4. Administrative Controls.**

3.6.4.1. Administrative controls consist of workplace requirements that reduce the duration, frequency, and forcefulness of ergonomic stressors.

3.6.4.2. Using administrative controls can be a useful and cost-effective adjunct to engineering and work practice controls. A simple example is when keyboard operators mix up their work by keyboarding, filing, and distributing materials so there are natural breaks in the work.

3.6.4.3. The disadvantage of administrative controls is that the measures can effectively mitigate the risk factors only when the workers' behavior is carefully regulated.

3.6.5. **Personal Protective Equipment (PPE).** PPE, such as gloves or padding, can help control risk factors such as temperature, vibration, or contact stress.

3.6.5.1. Gloves and padding must be carefully selected for fit, thickness, and material to be effective. The selection must also account for other hazards in the area such as chemical hazards, moving parts, and run-in points.

3.6.5.2. Devices worn on or attached to the wrist, back, or other joints to retard movement or provide support are not considered PPE for WMD hazards. There is no definitive proof that these devices can prevent WMD. BE or

the ground safety manager will not recommend these devices. See AFOSH Standard 91-31, *Personal Protective Equipment*.

**3.6.6. Effectiveness of Controls.** After the recommended controls are in place and used, BE resurveys the job to determine if the controls reduce employee exposure to risk factors without introducing new ones. In some cases, PT may be able to simulate the work to test the potential for the effectiveness before the changes are made.

3.6.6.1. After the resurvey, BE will present their findings at the next scheduled OHWG or EWG meeting.

3.6.6.2. After the recommended controls have been used for 6 to 12 months, PH may readminister JR/PD to the work group. These surveys should duplicate the original conditions to the extent practical so the results can be compared to the initial discomfort survey. Reduced employee discomfort is a good indicator that the control measures in place are working.

3.6.6.3. Based on the evidence, the OHWG or EWG determines if the problem job designation should be removed.

3.6.6.4. The OHWG or EWG notifies those organizations that have been removed from the problem job list.

**3.7. Quality Performance Indicators.** The OHWG or EWG tracks the following quality performance indicators (at least annually) for validated problem jobs to determine the effectiveness of the installation program.

- Leading Indicators
  - Percentage of workers trained
  - Percentage of jobs evaluated
  - Percentage of recommended controls implemented
- Lagging Indicators (use the number of workers in problem jobs as the denominator)
  - WMD incidence rate
  - WMD severity rate
  - WMD restricted workday rate

### **3.8. Anticipation of Ergonomic Design Needs.**

3.8.1. BE will review plans and designs to anticipate ergonomic risk factors in new or redesigned jobs, workstations, and tools.

3.8.2. BE researches published design guidance and lessons learned to provide designers with guidance to avoid introducing risk factors into the workplace.

3.8.3. AL/OEM will provide consultation on risk factors and sources of information for design guidelines.

### **3.9. Medical Management.**

3.9.1. Medical management reduces WMD through early diagnosis and treatment. When the occupational medicine physicians or other health care providers deem it necessary, they may participate in the work site assessments and job evaluations.

3.9.2. **Medical Restrictions.** Health care providers may recommend that an employee return to the same job with temporary activity restrictions during recovery or rehabilitation.

3.9.2.1. When a medical restriction has been recommended, the supervisor makes sure that the assigned job does not violate the medical restriction.

3.9.2.2. Upon request, BE will evaluate the tasks to make sure the activities meet the medical restrictions. PT/OT may be asked to assist with this evaluation.

3.9.3. **Medical Surveillance.** Considering the results of the JR/PD, the OHWG may recommend to the AMC specific work groups to receive physical exams. The purpose of the exam is to screen workers for early signs and symptoms of WMD.

3.9.3.1. The AMC determines the scope and frequency of the examinations. The physicians who will be performing these examinations should be represented in the decision-making process to make sure the examinations' purpose, content, and usefulness are not compromised.

3.9.3.2. Diagnostic standards used in medical surveillance must have sufficient specificity and sensitivity to make them reliable surveillance techniques.

3.9.4. The civilian personnel flight (CPF) designated Injury Compensation Program Administrator uses various case management methods to bring injured employees back to light duty. See AFI 91-301.

### **3.10. Training and Education.**

3.10.1. **Physician Review.** A qualified physician reviews the WMD training and education materials to promote consistency and to avoid miscommunication. A balance must be achieved between providing enough information for workers to recognize early signs of WMD, and avoiding the promotion of placebo effects or interference with a physician's ability to determine the validity of the disorders.

#### **3.10.2. General Awareness Education.**

3.10.2.1. PH offers initial and periodic awareness education to supervisors and employees in industrial jobs and in administrative jobs where computers are used. WMD awareness education may take many forms including briefings, newspaper articles, brochures, and computer software.

3.10.2.2. The objective of general awareness education is to make all workers aware of the benefits of seeking appropriate medical care before musculoskeletal symptoms progress to chronic disability. The education will cover description of WMD and the associated ergonomic risk factors, recognition of symptoms associated with ergonomic disorders, the importance of early medical intervention, and local procedures for reporting suspected ergonomics risk factors and WMD.

3.10.2.3. For jobs that use computers, PH tailors the training toward the specific needs of computer users and describes the proper computer workstation set-up.

#### **3.10.3. Targeted Training.**

3.10.3.1. Supervisors of problem jobs and supervisors of jobs that routinely use computers provide specific initial and annual training until the risk factors have been reduced to a point that they pose no potential risk.

3.10.3.2. This training conveys the following specific information:

- Specific activities or processes that pose an increased risk of WMD for employees;
- Proper use of existing tools and equipment to prevent WMD; and
- Control measures and how they affect specific risk factors identified in the work group.

3.10.3.3. If the risk factors are associated with computer use, the training includes the proper use and adjustment of existing computer workstation furniture, chairs, and accessories to minimize the ergonomic risk factors.

3.10.3.4. PH helps develop and provides training upon request.

3.10.3.5. Supervisors record training on each employee's AF Form 55, *Employee Safety and Health Record*, or the electronic equivalent. See AFI 91-301.

3.10.3.6. PH records employee training on AF Form 2767, *Occupational Health Training & Protective Equipment Fit Testing*.

### **3.11. Employee Involvement.**

3.11.1. Employees doing the work are a vital link to effective problem-solving. Their input is actively solicited and used as much as possible in selecting control measures to reduce risks.

3.11.2. Employee ideas are the best resource available. They provide information on what proposals can be used and which proposals will not work.



## *Chapter 4*

### ***SPECIFIC PROGRAM GUIDELINES***

**4.1. Scope of Guidelines.** The guidelines in this chapter are not mandatory. This information should be used as a starting point to initiate an installation WMD program. The program should be continually improved by inserting new information on risks, dose-response, approaches, and control measures.

**4.2. Installation Working Group.**

4.2.1. Establishing an EWG as a working group under the AFOSH Council should only be considered when the nature of the WMD risks on an installation are widespread or complex. The OHWG can provide the appropriate management for bases that do not have extensive WMD risks. If an EWG is not established, then the ground safety manager and OT/PT must be an integral part of the OHWG.

4.2.2. The OHWG or EWG should:

- Review the results of passive surveillance collected and analyzed by PH and other members.
- Develop and update, as needed, a list of recognized (potential problem) jobs.
- Discuss newly recognized work groups at the next meeting after they are discovered.
- Analyze associations between risk factors, employee discomfort, and reported WMD.
- Identify problem jobs for work analysis.
- Examine trends and causes associated with unreported WMD.
- Review the need for medical surveillance, education, and training.
- Review the effectiveness of education, training, and control measures.
- Review program quality performance indicators and determine strategies for improvement.

4.2.3. The OHWG or EWG should presume the following areas have a high potential for WMD risk unless information collected at the installation indicates otherwise:

- Structural Maintenance or Repair
- Allied Trades
- Commissary
- Survival Equipment and Life Support

**4.3. Signal Risk Factors.** Unless regulators mandate the use of specific signal risk factors, they should be tailored to cover local conditions. The signal risk factors below provide a set of criteria that can be used for recognizing potential problem jobs resulting from routine exposure:

- Repetitive motions for >2 hours at a time or >4 hours/day
- Fixed or awkward postures for >2 hours/day
- Forceful hand exertions for >2 hours/day
- Vibration from tools (or equipment) for >2 hours/day
- Manual material handling >2 hours/day
- Unassisted lifting of loads >25 lb.

**4.4. Survey Types.** Air Force work should be divided into categories to make it convenient to organize data, to compare the effectiveness of control measures, to conduct work analysis, and to plan training.

4.4.1. Before beginning the work analysis, BE selects the appropriate survey category from one of these:

- Maintenance and Inspection
- Assembly Line
- Warehouse
- Administrative



**4.5. Work Analysis.** Work analysis targets the risk factors associated with employee discomfort and recommends controls to minimize or eliminate the exposure.

**4.5.1. Level I Work Analysis.** A Level I Work Analysis consists of identifying high risk tasks and matching them with accepted solutions for reducing WMD risk. This type of analysis may be especially suitable for maintenance or inspection tasks where workers perform a variety of common tasks at various frequencies and durations.

**4.5.1.1.** Caution must be exercised when using Level I Analysis. Control strategies may apply only to tasks performed under specific conditions. For example, a pistol grip drill can keep the hand and wrist in a neutral posture while drilling on a vertical surface at elbow level, but it can cause the hand and wrist to deviate (bend) while drilling on surfaces at other levels and orientations.

**4.5.1.2.** Caution must also be exercised to make sure these solutions are not applied to tasks that are done at a frequency or duration that does not risk WMD. Do not apply solutions just because they match a task without verifying that the level of exposure poses a significant risk. Applying solutions where risk does not exist wastes resources and could reduce the overall program credibility on the installation.

**4.5.2. Level II Work Analysis.** A Level II Work Analysis is used for more complex situations where Level I solutions are not available or do not apply. A Level II Work Analysis quantifies exposure to the extent practical and results in recommended control measures to minimize or eliminate the exposure. A Level II Work Analysis should contain the following information:

- Surveyor name
- Date
- Work group name and identifier (if available)
- Executive summary
- Summary of symptom survey results for the work group
- Review of previous work analyses (if available)
- Employee demographics (age, sex, dominant hand, etc.)
- Work schedules/variations
- Identification of homogeneous exposure groups (HEG) within the work area
- Activity/task breakdown for each HEG
- Workstation and equipment descriptions
- Materials and part(s) being processed
- Description of hand tools used (if applicable)
- Environmental conditions
- Conditions of walking and working surfaces
- Personal protective equipment used (if applicable)
- Quantification of fixed and awkward body and limb postures (if applicable)
- Evaluation of manual material handling tasks (if applicable)
- Quantification of repetitive movements by body part
- Estimate of forceful exertions being applied (if applicable)
- Location of contact stress (if applicable)
- Vibration measurement results and analysis (if applicable)
- Productivity and quality requirements
- Control measures that would minimize or eliminate the ergonomic risk factors identified during the analysis

**4.5.3.** Only BE personnel with specialized ergonomic training, consultants from AL/OE, industrial hygienists with specialized ergonomic training, or ergonomists should perform Level II work analyses.

**4.5.4.** Work analyses done previously may be used, if they apply to the current processes and activities.

#### **4.6. Reference Standards.**

4.6.1. Where possible, BE analyses should refer to the appropriate consensus standards, texts, design standards such as the most recent edition of Military Standard 1472, *Human Engineering Design Criteria for Military Systems, Equipment and Facilities*, and other references

4.6.2. **NIOSH Lifting Model.** Analysis of applicable lifting tasks should be made using the latest version of the *Revised National Safety and Health (NIOSH) Lifting Equation*.

4.6.3. **Snook-Ciriello Tables.** Manual materials handling tasks involving pushing, pulling, and carrying should be evaluated using the *Revised Tables of Maximum Acceptable Weights and Forces*. See the reference in Attachment 1. Additional guidance concerning manual material handling can be found in AFOSH Standard 91-46, *Manual Material Handling*.

4.6.4. **American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) for Hand-Arm Vibration.** Vibration from hand tools should not exceed the ACGIH TLV for hand-arm vibration. Direct measurements or data from similar tools should be used for comparison to the ACGIH TLV. Weighted, unweighted, and 1/3 octave band accelerations should be recorded for each hand tool measured.

#### 4.7. Simple Abatement Actions.

4.7.1. **Quick Fixes.** In many cases, risk factors can be easily identified and remedied by the supervisor working with the affected employees without a Level II work analysis.

4.7.2. **Computer Work Stations.** Supervisors follow a checklist review and reduce the risk factors for computer work stations. The checklist in Attachment 2 provides a guide and may be updated locally.

4.7.3. **Possible Solutions.** The list below outlines some simple corrective actions that can be applied to reduce risk factors. This list does not give a complete analysis. It only suggests some possible solutions for review:

- Repeated Movements or Sustained Tasks
  - Use mechanical aids (arm rests, wrist rests, power tools, power tools, etc.)
  - Adjust the work load (reduce the pace or expected output)
  - Rotate workers (assign different workers to the different tasks to avoid repeated movements)
  - Enlarge work (combine tasks that require different motions)
- Forceful Activities
  - Select gloves or handles that improve grip
  - Reduce weight of tools
  - Balance tool weights so the wrist does not have to force the tool into the proper position
  - Attach balancers and hoists to support tools
  - Use reaction bars or articulating arms to reduce recoil
  - Use fixtures to hold parts into place
  - Apply leverage to assist with force
  - Reorient the direction of the force in line with the natural movements of the limbs and body
- Lifting and Carrying
  - Use mechanical devices such as rollers, conveyors, and hoists
  - Use gravity to move objects
  - Store objects to be lifted at heights between the knees and the shoulders
  - Store heaviest objects to be lifted at waist height from the floor
  - Provide handles on objects to be lifted and carried
  - Make sure walking and working surfaces are not slippery
- Contact Stress from Tools and Equipment
  - Use tools with long handles and handles with rounded edges
  - Use materials that yield to pressure at contact points (rubber, etc.)
  - Cushion hard, sharp table edges
  - Wear soft gloves to reduce pressure

- **Awkward or Fixed Posture**
  - Adjust work and workpiece so the body, limb, or body part can remain in a comfortable position
  - Select tools that allow the wrist to remain straight during use
  - Provide creepers, rollers, stools, or other support for work underneath aircraft or vehicles so arms and shoulders can remain in a comfortable position
- **Vibration**
  - Isolate the hand and wrist from the vibration
  - Select tools with less vibration
  - Wear gloves that reduce the vibration transmitted from the tool to the hand and arm
- **Contact with Cold**
  - Wear gloves
  - Use handles and grips that do not conduct cold
  - Direct exhaust air from tools away from the body and limbs

#### **4.8. Optional Awareness Education.**

4.8.1. **Executive-Level Management.** As necessary, BE or PH should brief executive-level management on:

- The concept and the interrelationships of ergonomics, WMD, cumulative trauma disorders (CTD), and repetitive stress injuries (RSI);
- Reason for implementing a WMD prevention program;
- Elements of the installation WMD prevention program and benefits associated with it;
- WMD hazards and controls;
- Management's responsibilities under this standard, and
- Resources required for a successful installation WMD program.

4.8.2. **Health Care Providers Education.** The OHWG or EWG should assess the need for health care providers to have briefings on the care, handling, and reporting of WMD. Health care providers must understand how to report that they suspect an employee's job is related to the signs and symptoms that they have observed. This reporting is the key to effective hazard identification and control.

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## **GLOSSARY OF REFERENCES, ABBREVIATIONS, ACRONYMS, AND TERMS**

### ***Section A--References***

Air Force Instruction (AFI) 48-101, *Aerospace Medical Operations* (formerly AFR 161-33).

AFI 91-204, *Investigating and Reporting US Air Force Mishaps* (formerly AFR 127-4).

AFI 91-301, *The Air Force Occupational and Environmental Safety, Fire Protection, and Health Program* (formerly AFR 127-12).

Air Force Occupational Safety and Health (AFOSH) Standard 91-31, *Personal Protective Equipment* (formerly AFOSH Standard 127-31).

AFOSH Standard 91-46, *Manual Material Handling*

AFOSH Standard 161-17, *Standardized Occupational Health Program*

Air Force Policy Directive (AFPD) 48-1, *Aerospace Medical Program* (formerly AFR 161-33)

American Conference of Governmental Industrial Hygienists, *Threshold Limit Values for Chemical Substances and Physical Agents*

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#### **Section B—Abbreviations and Acronyms**

ACGIH	American Conference of Governmental Industrial Hygienists
AETC	Air Education and Training Command
AFI	Air Force Instruction
AFIA	Air Force Inspection Agency
AFMC	Air Force Materiel Command
AFMOA	Air Force Medical Operating Agency
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
AFR	Air Force Regulation (obsolete designation)
AFSC	Air Force Safety Center
AL	Armstrong Laboratory
AMC	Aeromedical Council
ANSI	American National Standards Institute
ASAP	Aerospace Safety Automation Program
BE	Chief, Bioenvironmental Engineering
CP	Chief, Civilian Personnel
DRU	Direct Reporting Unit
EWG	Ergonomics Working Group
FOA	Field Operating Agency
GOCO	Government-Owned, Contractor-Operated
HCP	Health Care Provider
HEG	Homogeneous Exposure Group
HFS	Human Factors Society
HQ	Headquarters
ICD-9CM	International Classification of Diseases, Clinical Modifications, 9th Revision
JR/PD	Job Requirements and Physical Demands Survey
MAJCOM	Major Commands
MTF	Medical Treatment Facility
NIOSH	National Institute for Occupational Safety and Health
OHWG	Occupational Health Working Group
OM	Chief, Occupational Medicine
OMB	Office of Management and Budget
OPR	Office of Primary Responsibility
OSHA	Occupational Safety and Health
PH	Chief, Public Health
PPE	Personal Protective Equipment
PT/OT	Chief, Physical Therapy or Occupational Therapy
POM	Program Objective Memorandum
SAF	Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health)

SG	Surgeon General
TLV	Threshold Limit Value
TO	Technical Order
USAFSAM	United States Air Force School of Aerospace Medicine
WMD	Work-Related Musculoskeletal Disorder

## ***Section C—Terms***

### **Terminology Used:**

**Shall.** Indicates a mandatory requirement.

**Will.** Indicates a mandatory requirement which expresses a declaration of intent, probability or determination.

**Should.** Indicates a preferred method of accomplishment.

**May.** Indicates an acceptable or satisfactory method of accomplishment.

### **Definitions:**

**Administrative Controls.** Any procedure that significantly limits exposure to ergonomic risk factors by control or manipulation of the work schedule or manner in which work is performed. Includes job rotation, use of rest breaks or alternative tasks, and job enlargement to increase task variability.

**Active Health Surveillance.** The systematic collection, analysis, and interpretation of data obtained through a group administered job requirements and physical demands survey to determine the scope of potential or actual work-related musculoskeletal disorders in one or more work groups.

**Anthropometry.** The study of the physical dimensions of people, including size, breadth, girth, distance between anatomical points, and joint range of motion.

**Assembly Line.** A job where employees perform essentially the same tasks in the same sequence throughout the day. The commissary checkout counter is an example.

**Awkward Posture.** A deviation from the neutral position of any particular joint. Examples include extreme flexing, extending, bending or rotating parts of the body; reaching behind the trunk; holding arms above the shoulders; etc.

**Contact stress.** A type of trauma inflicted by direct contact of various body parts with workpieces, tools, or work surfaces. Mechanical stress generated on tendons and nerves can lead to work-related musculoskeletal disorders.

**Discomfort Prevalence Ratio.** The percentage of employees reporting discomfort in a particular body part. For WMD, discomfort should be persistent and associated with the ergonomic risk factors.

**Engineering Controls.** Physical changes to work stations, equipment, materials, facilities, or any other relevant aspect of the work environment that reduce or prevent exposure to ergonomic risk factors.

**Ergonomics.** The field of study that seeks to fit the job to the person, rather than the person to the job. This is achieved by the evaluation and design of workplaces, environments, jobs, tasks, equipment, and processes in relationship to human capabilities and interactions in the workplace.

**Fixed Postures.** Prolonged muscle contraction without movement. Examples include stringing wire overhead and prolonged gripping of a hand tool.

**Incidence Rate.** The number of new WMD occurring during a year per 100 full-time equivalent workers. Incidence rates are calculated as follows:

*(Number of new WMD in problem jobs) X (200,000 hours or 100 full-time equivalent workers) / (Work hours per year or number of full-time equivalent workers in problem jobs)*

**Job.** A series or combination of tasks to reach a goal or produce an end product. Workers may be assigned to the same organization and have the same title, but might not do the same job if their combinations of tasks differ.

**Maintenance/Inspection.** Work where employees perform a variety of activities or processes as part of their normal job duties. Structural repair and Allied Trades are examples.

**Manual Material Handling.** The act of pushing, pulling, carrying, holding, and lifting objects from one location to another.

**OSHA 200 Log.** A paper or electronic record equivalent to the OSHA Form 200 used to record occupational illnesses and injuries.

**Passive Health Surveillance.** The systematic collection, analysis, and interpretation of existing records and data to identify incidents and patterns of work-related musculoskeletal disorders and potential problem jobs.

**Potential Problem Job.** A combination of tasks for which one or more employees report a WMD, or for which signal risk factors show a *potential* risk for developing WMD.

**Problem Job.** A combination of tasks for which an association can be shown between risk factors, employee discomfort, and reported WMD (if applicable).

**Restricted Workday Rate.** The number of restricted workdays due to WMD occurring during a year per 100 full-time equivalent workers. Restricted workday rates are calculated as follows:

*(Number of restricted workdays due to WMD in problem jobs) X (200,000 hours or 100 full-time equivalent workers) / (Work hours per year or number of full-time equivalent workers in problem jobs)*

**Risk Factors.** Attributes, experiences, and exposures that increase the probability of occurrence of WMD. Risk factors include repetitive, forceful, or prolonged exertions; frequent or heavy lifting; pushing, pulling, or carrying of heavy objects; fixed or awkward work postures; contact stress; localized or whole-body vibration; and temperature extremes and poor lighting (leading to awkward postures). These risk factors can be intensified by work organization characteristics, such as inadequate work-rest cycles, excessive work pace and/or duration, unaccustomed work, lack of task variability, machine work, and piece rate. Specific dose-response relationships between ergonomic risk factors and work-related musculoskeletal disorders are not yet known.

**Risk Factor Survey.** Form used for rapid general characterization of an employee's exposure to signal risk factors.

**Routine Exposure.** Approximately daily; three or more days per week.

**Severity Rate.** The number of lost workdays due to WMD occurring in a year per 100 full-time equivalent workers. Calculate severity rates as follows:

*(Number of lost workdays due to WMD in problem jobs) X (200,000 hours or 100 full-time equivalent workers) / (Work hours per year or number of full-time equivalent workers in problem jobs)*



**Signal Risk Factors.** An exposure level for risk factors used to recognize jobs that have the potential to produce WMD. Signal risk factors are used to screen jobs that should not require further attention from those that should be surveyed.

**Task.** The smallest unit of work that will be used for assessing worker exposure. Each task consists of a distinct activity in the work performed by an individual. Examples include riveting, grinding, lifting, etc.

**Vibration.** The oscillatory motion of a physical body. Localized (segmental) vibration, such as hand-arm vibration, is produced by contact with powered tools or equipment. Whole body vibration exposure occurs while standing or seated in vibrating environments or objects, such as trucks, heavy machinery, or while using heavy equipment such as jackhammers.

**Warehouse.** Work where employees perform primarily manual material handling tasks throughout the day. Base Supply is an example.

**Work Analysis.** The systematic investigation of work activities to identify risk factors, evaluate their probable causes, and develop controls to minimize or eliminate the identified risk factors.

**Work Practice Controls.** Changing or improving procedures commonly followed in the workplace to minimize or eliminate ergonomic risk factors. Examples of work practices controls include: using proper lifting techniques in manual materials handling operations; adjusting work flow or line speed; and routine tool-sharpening and maintenance.

**Work-Related Musculoskeletal Disorder.** Illness or injury of the muscles, tendons, ligaments, peripheral nerves, joints, bones, and/or supporting blood vessels in either the upper or lower extremities, or back, which are associated with routine exposure to ergonomic risk factors and which are not the result of an acute or instantaneous event (e.g. slips or falls). Commonly used terms, such as "cumulative trauma disorders", "repetitive strain injuries or illnesses", "repetitive motion injuries or illnesses", and "repetitive stress injuries or illnesses" are included in this definition.

**Workstation.** An individual employee's work area, such as a desk, chair, and computer or an individual maintenance or inspection station.

## CHECKLIST FOR COMPUTER WORKSTATIONS

A.2.1. Supervisors and employees use this checklist to evaluate computer workstations that are used periodically. This checklist may be changed to meet local conditions, to improve its usefulness, or to incorporate new regulatory requirements as they arise.

A.2.2. Is the employee able to:

- Y N ...rest the feet comfortably on the floor or footrest?
- Y N ...sit with the knees and legs in a comfortable position without interfering obstructions?
- Y N ...work with the head vertical (not holding head forward or to the side)?
- Y N ...work without repeatedly rotating the head forward, backward, or to the side?
- Y N ...work without reaching or bending the trunk repeatedly or extended for long durations?
- Y N ...work with the shoulders in a relaxed or comfortable position?
- Y N ...hold the wrists in a neutral or comfortable position with support available, if needed?
- Y N ...hold elbows in a position that do not force shoulders or elbow positions from the neutral position?
- Y N ...change posture frequently?

A.2.4. Does the seat have:

- Y N ...height and slope adjustments?
- Y N ...a seat pan deep and wide enough to comfortably accommodate the employee?
- Y N ...a "waterfall" front edge so the employee does not have excess pressure under the leg?
- Y N ...a backrest that can be adjusted to provide lower back support?

A.2.5. Does the work surface have:

- Y N ...enough width to locate accessories within a comfortable reach?
- Y N ...enough depth that the monitor and keyboard can be placed directly in front of the employee?
- Y N ...enough area to allow free movement of feet, legs, and knees beneath the surface?

A.2.6. Is the computer (VDT) monitor:

- Y N ...at a level slightly below the employee's eye level?
- Y N ...adjustable between 18 and 30 inches from the employee?
- Y N ...screen clean and free from flickering?
- Y N ...adjustable for brightness and contrast?
- Y N ...screen able to adjust horizontally, tilt vertically, and yaw (rotate)?
- Y N ...screen well-lit without glare on the screen from lights, windows, or reflected surfaces?

A.2.7. Is the keyboard:

- Y N ...detachable from the display unit?
- Y N ...height and angle easily adjustable?
- Y N ...keystroke pressure comfortable for the employee?

A.2.8. Is the mouse:

- Y N ...shape, size and button comfortable and easy to operate?
- Y N ...located so the employee does not have to reach repeatedly or for extended durations?

A.2.9. Is the a holder or support for source document:

- Y N ...located so the employee is not required to rotate head excessively or for long durations?
- Y N ...easy to adjust?

A.2.10. Is there adjustable support

Y N ...for arms (armrests)?

Y N ...for palms at the keyboard?

## MUSCULOSKELETAL DISORDERS BY ICD-9CM CODE

**A.3.1.** These ICD-9CM Codes encompass illnesses that can arise from workplace exposure.

**A.3.2.** When health care providers encounter these illnesses, they should question whether they may have been caused or exacerbated by the patient's work.

**A.3.3.** Health care providers who suspect that one of these illnesses relates to the workplace must complete an SF 513 and submit it to PH.

353.0 (Thoracic Outlet Syndrome)  
354.0 (Carpal Tunnel Syndrome)  
354.2 (Cubital Tunnel Syndrome)  
354.5 (Digital Neuritis)  
354.2 (Pronator Teres Syndrome)  
354.3 (Radial Tunnel Syndrome)  
444.21 (Hypothenar Hammer)  
443.0 (Raynaud's Syndrome)  
715 (Osteoarthritis)  
722 (Intervertebral Disc Disorders)  
723.1 (Cervicalgia)  
724.1 (Thoracic Spine Pain)  
724.2 (Lumbago/Low Back Pain)  
724.3 (Sciatica)  
724.5 (Backache, Unspecified)  
726.1 (Rotator Cuff Syndrome)  
726.2 (Shoulder Periarthritis)  
726.32 (Lateral Epicondylitis)  
727.0 (Synovitis/Tendonitis)  
727.03 (Trigger Finger)  
727.04 (DeQuervains Disease)  
727.05 (Hand/Wrist Tenosynovitis)  
727.2 (Specific Bursitides)  
727.4 (Ganglion Cyst (all series))  
728.4 (Game-Keeper's Thumb)  
728.85 (Muscle Spasms)  
729.81 (Swelling)  
729.92 (Cramp, Tingling in Hands)  
840-8 (Muscle Strain/Sprain)

## APPENDIX B



Customer  
POC and Phone: \_\_\_\_\_

Customer  
Office Symbol: \_\_\_\_\_

Date: \_\_\_\_\_

Division: OEMO

## TECHNICAL REPORT SATISFACTION SURVEY (AF PREMIER Program Management Guidelines)

This survey is used to help us improve our service to you. Your answers will be held in confidence and will significantly impact how we allocate resources to meet your needs. Upon completion of your review, please mail or fax (DSN 240-2288/Comm 210-536-2288) this form to our Quality Assurance office (OEPQ). Thank you very much!

GRADING SCALE:	EXTREMELY DISSATISFIED	DISSATISFIED	SLIGHTLY DISSATISFIED	SLIGHTLY SATISFIED	SATISFIED	EXTREMELY SATISFIED	N/A
	1	2	3	4	5	6	

<b>FORMAT:</b> Is the report understandable and well organized?	1	2	3	4	5	6	N/A
<b>CONTENT:</b> Does it provide you with necessary program implementation guidelines or data collection tools?	1	2	3	4	5	6	N/A
<b>USEFULNESS:</b> Did you use this product and, if so, was it easy to use?	1	2	3	4	5	6	N/A
<b>QUALITY:</b> Are you satisfied with the quality of this product?	1	2	3	4	5	6	N/A
<b>SUPPORT:</b> Are you satisfied with the support we have provided on this product?	1	2	3	4	5	6	N/A
<b>OVERALL:</b> Overall, how would you rate this product?	1	2	3	4	5	6	N/A

**Comments/Suggestions:** Did you find any errors or omissions? Will you continue to use this product? Are there any specifics of this product you would like to discuss? Are there other services you would like provided in the future? (Use back of page if more space is required.)

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OFFICIAL BUSINESS

Return to:

Armstrong Laboratory / OEPQ  
2402 E Drive  
Brooks AFB, TX 78235-5114